UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,353	06/19/2006	Tim Prestidge	128452	9813

25944 7590 04/15/2009

OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
CHANG, SUNRAY	
ART UNIT	PAPER NUMBER
2121	
MAIL DATE	DELIVERY MODE
04/15/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,353	PRESTIDGE ET AL.	
	Examiner	Art Unit	
	Sunray R. Chang	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

P.O. Box 1450, Alexandria, Virginia 22313-1450 - WWW.USPTO.GOV

Examiner's Detailed Office Action

1. This Office Action is responsive to communication, filed on June 29th, 2009.

Responses to Amendments & Arguments

Objection to Amendment

2. The objection has been withdrawn in response to the clarification for amendment on June 16th, 2006 in an Interview on December 8th, 2008.

Claim Rejections - 35 USC § 101

3. Applicant amends the claims to overcome forth 101 rejection, which has been withdrawn in current office action.

Claim Rejections - 35 USC § 102 / 103

4. Applicant amends the independent claims to include further limitations "combining the first data set with the second data set such that each element of the two sets are associated with the same real time or synchronization signal; and outputting the combined data to a further software process which is used to improve the workpiece producing process", and further argues the combination of examiner cited references, **Locke** and **Bieg**, fails to teach this limitation; however, it is not clearly defined how to "combine the first data set with the second data set" and a term, "associated", is not clearly defined in the claims, which can be broadly interpreted to be any kind of relationships; further more, **Locke** reference teaches two data sets, one is from

position scale 48, one is from workpeice 18, combined in calculating unit 44, as indicated in fig. 2, which has been explained in below rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claim(s) 1 – 13 is/are rejected** under 35 U.S.C. 103(a) as being unpatentable over Dennis H. Locke et al. (U.S. Patent No. 4,974,165, and referred to as **Locke** hereinafter) in view of Lothar F. Bieg et al. (U.S. Patent No. 6,519,860, and referred to as **Bieg** hereinafter).

Regarding claim(s) 1, 10 and **13**

Locke teaches,

- A workpiece inspection system comprising a machine tool which has a controller operable to perform a workpiece producing process and a workpiece inspection process, [a real-time machining control system is provided which includes a conventional computer numerical control and a dimensional measurement system which continually measures the actual diameter of the rotating workpiece and provides an error signal representing the difference

between the actual diameter of the workpiece and that of the part program. The error signal is used to directly control the movement of the cutting tool to assure the final dimentions of the workpiece, Abstract]

- the inspection process including a method for synchronising varying data relating to measurements of the workpiece from a measurement device with varying data relating to machine position from the machine tool, [continually measures the actual diameter of the rotating workpiece and provides an error signal representing the difference between the actual diameter of the workpiece and that of the part program. The error signal is used to directly control the movement of the cutting tool to assure the final dimentions of the workpiece, Abstract] comprising in any suitable order the steps of:
- mounting the measurement device on the machine tool; [fig. 3]
- changing the position of the workpiece relative to the measurement device; [rotating workpiece, Abstract]
- causing measurements of the workpiece to be taken by the measurement device; [provides an error signal representing the difference between the actual diameter of the workpiece and that of the part program. The error signal is used to directly control the movement of the cutting tool to assure the final dimentions of the workpiece, Abstract]
- issuing synchronisation signals defining a plurality of instants; [feeding data defining a desired profile and dimensions of the workpiece to a computer, producing from the computer a succession of digital signals defining a succession of required cutting tool positions to machine the workpiece to that profile and dimension, continually determining an actual dimension or parameter of the rotating workpiece and deriving an error signal representing

the difference between said actual dimension or parameter of the workpiece and that of the part program, and feeding the error signal to means for controlling the movement of the cutting tool to assure that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

The examiner further explains, "issuing synchronization signals defining instants" can be a program in a computer system initiating the function of the controlled components.

- recording a first set of the varying data relating to the position of the machine at least at some of the instants; [deriving an error signal representing the difference between said actual dimension or parameter of the workpiece and that of the part program, col. 2, line 55 – col. 3, line 4] and
- recording a second set of the varying data from the measurement device relating to measurements of the workpiece at least at some of the instants. [continually determining an actual dimension or parameter of the rotating workpiece, col. 2, line 55 – col. 3, line 4]

The examiner further explains, "relating", covers all related data, including the "error" signal is also related with "position of the machine". The examiner consider this invention is specifically to discuss "position of the machine", not "related", thus, the examiner cites another reference as indicated below to continue the prosecution.

Regarding claim 13, "first part", "second part" related limitations can be found in **Locke** reference fig 1, 3 and 4.

Locke does not teach recording the position of the machine.

Locke further teaches combining the first data set with the second data set such that each element of the two sets are associated with the same real time or synchronization signal; and outputting the combined data to a further software process which is used to improve the workpiece producing process [Calculating unit 44 is operative to process the signals fed to it. For example, it compares the information from scale 48 with a table Z-axis dimensions. If there is a match it issues a latch command to read all sensors. If there is a difference it feeds an error signal to summer 45, col. 5, lines 36 – 41]

Bieg teaches measures the true position of the milling head … compares the true (real) measured position with the desired, and creates a position error signal …, col. 20, line 62 – col. 21, line 17; fig. 23], for the purpose of providing independent, real-time position feedback control of a movable machine member [col. 20, line 62 – col. 21, line 17; see more details in col. 5, lines 11 – 48].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Locke** to include "recording the position of the machine", for the purpose of providing independent, real-time position feedback control of a movable machine member, col. 20 [line 62 – col. 21, line 17].

Regarding **claim(s) 2, Locke** teaches,

- the synchronisation signal issues from the controller. [feeding data defining a desired profile and dimensions of the workpiece to a computer, producing from the computer a succession of digital signals defining a succession of required cutting tool positions to machine the workpiece to that profile and dimension, continually determining an actual dimension or

parameter of the rotating workpiece and deriving an error signal representing the difference between said actual dimension or parameter of the workpiece and that of the part program, and feeding the error signal to means for controlling the movement of the cutting tool to assure that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

Regarding **claim(s) 3**, **Locke** teaches,

- the synchronisation signal is used to identify the real time at which at least some of the members of the first and second sets of data from the machine tool and measurement device were recorded in order that the position data and the measurement data can be combined with a related real time. [real-time machining and on-machine inspection system, col. 1, lines 11 – 15; deriving an error signal representing the difference between said actual dimension or parameter of the workpiece and that of the part program, and feeding the error signal to means for controlling the movement of the cutting tool to assure that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

Regarding **claim(s) 4**, **Locke** teaches,

- the measurement device is monitored at intervals which are more frequent than the occurrences of the said intervals and only selected data is recorded to the second set and/or the data is manipulated prior to its recording. [real-time, [real-time machining and on-machine inspection system, col. 1, lines 11 – 15; deriving an error signal representing the

difference between said actual dimension or parameter of the workpiece and that of the part program, and feeding the error signal to means for controlling the movement of the cutting tool to assure that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

The examiner considers "is monitored" to be "is monitoring", since the measurement device is used to monitor, not to be monitored; further, "selected data" can be the real-time monitored data.

Regarding **claim(s) 5**, **Locke** teaches,

- software for combining the data of the first and second sets and, when combined, for influencing the workpiece producing process performed at the controller of the machine tool. [deriving an error signal representing the difference between said actual dimension or parameter of the workpiece and that of the part program, … continually determining an actual dimension or parameter of the rotating workpiece … feeding the error signal to means for controlling the movement of the cutting tool to assure that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

The examiner explains, "combining" can be simply generating the error signal.

Regarding **claim(s) 6**, **Locke** teaches,

- an interface circuit which accepts the synchronisation signal and the varying data from the measurement device. [fig. 2]

Regarding **claim(s) 7, Locke** teaches,

- a stop signal path from the measurement device to the machine controller and the machine controller stops the machine if a stop signal is received by the machine controller. [shut down the machine, col. 1, lines 57 – 59]

Regarding **claim(s) 8**,

Bieg teaches,

- the measurement device is a contact type dimensional measurement probe and the varying data relates to changes in the deflection of a workpiece contact stylus connected to the probe [ACMM's probe tip can be physically attached to a movable machine member (e.g. a machine tool holder, or end effector of a robotic arm) to provide independent, real-time measurement of the member's position in one, two, or three-dimensional Cartesian space, col. 7, lines 16 – 21], for the purpose of providing independent, real-time position feedback control of a movable machine member, col. 20 [line 62 – col. 21, line 17].

Regarding **claim(s) 9**,

- the first set of data is corrected to at least reduce positional errors of the machine tool, prior to combination with the second set. [deriving an error signal representing the difference between said actual dimension or parameter of the workpiece and that of the part program, … continually determining an actual dimension or parameter of the rotating workpiece … feeding the error signal to means for controlling the movement of the cutting tool to assure

that the final actual machined profile and dimensions of the workpiece conform to the desired part program, col. 2, line 55 – col. 3, line 4]

Regarding **claim(s) 11**,

- the controller issues a further signal which enables the recording of the second set. [to continually measure the workpiece diameter in real-time and provide dimensional feedback to keep the workpiece diameter within tolerances, col. 2, lines 17 – 20]

Regarding **claim(s) 12**,

Software for controlling a workpiece inspection system according to the steps claimed in claim 1. [part program, col. 2, lines 12 – 20]

Conclusion

6. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence Information

7. Any inquires concerning this communication or earlier communications from the examiner should be directed to Sunray Chang, who may be reached Monday through Friday, between 6:00 a.m. and 3:00 p.m. EST. or via telephone at (571) 272-3682 or facsimile transmission (571) 273-3682 or email sunray.chang@uspto.gov.

If you need to send an Official facsimile transmission, please send it to (571) 273-8300.

If attempts to reach the examiner are unsuccessful in the regular office hour, the Examiner's Supervisor, Albert Decady, may be reached at (571) 272-3819.

/Ronald D Hartman Jr./
Primary Examiner, Art Unit 2121

for

Sunray Chang
Art Unit 2121
U.S. Patent & Trademark Office

April 14, 2009